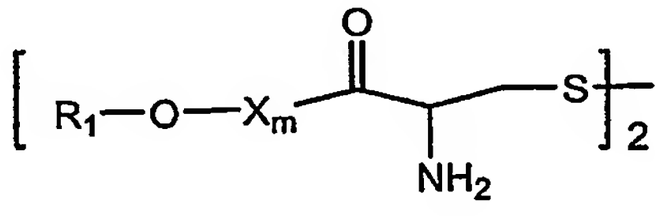
CLAIMS:

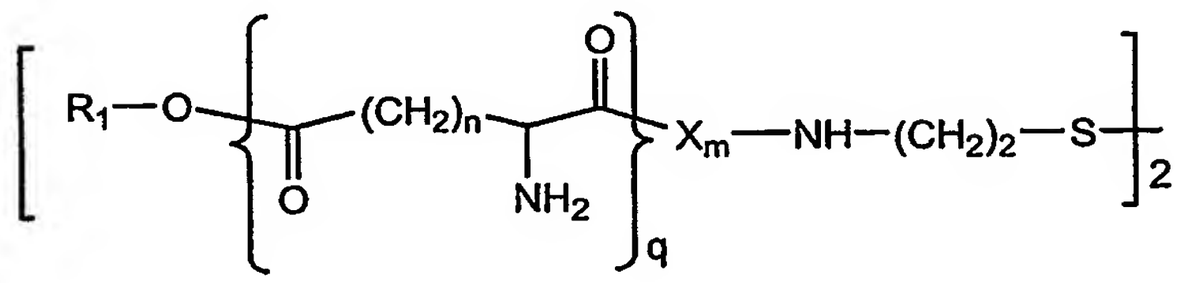
1. A pharmaceutical composition useful for the treatment of cancer comprising a compound selected from the formula consisting of

(a)



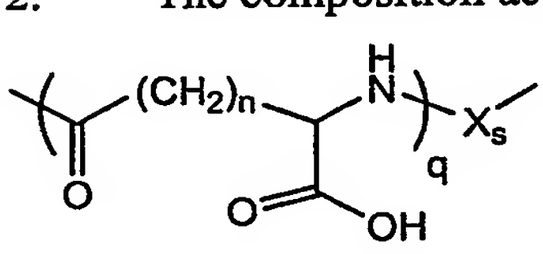
and

(b)



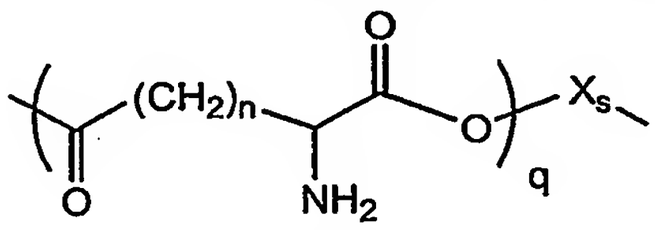
wherein for either formula (a) and (b), R_1 is a substituted or unsubstituted lower alkyl of 1 to 10 carbon atoms, X is a naturally-occurring or non-naturally-occurring amino acid, and m is an integer of 0 to 20 and wherein for formula (b), n is an integer of 1 or 2, and q is an integer of 0 or 1, or a pharmaceutically acceptable salt thereof in a pharmaceutically acceptable carrier.

2. The composition according to claim 1, wherein X_m of formula (a) is



wherein n is an integer of 1 or 2, and q is an integer of 0 or 1, and s is an integer of 0 to 19.

3. The composition according to claim 1, wherein X_m of formula (a) is



wherein n is an integer of 1 or 2, and q is an integer of 0 or 1, and s is an integer of 0 to 19.

4. The composition according to claim 1, wherein for said formula (a) m is 0.

5. The composition according to claim 4, wherein for said formula (a) said R_1 is a methyl group, and said compound is cystine dimethyl ester.

6. The composition according to claim 2 or 3, wherein X is selected from the group consisting of D-Asp, L-Asp, D-Glu and L-Glu and m is 1.

7. The composition according to claim 1, wherein for said formula (b) q is 1 and m is 0.

8. The composition according to claim 1, wherein for said formula (b) said R_1 is a methyl group.

9. The composition according to claim 1, wherein m is an integer from 1 to 10.

10. The composition according to claim 1, wherein m is 1.

11. The composition according to claim 1, comprising at least one compound of formula (a) and at least one compound of formula (b).

12. The composition according to claim 1, further comprising an additional cytotoxic compound.

13. The composition according to claim 12, wherein said cytotoxic compound is an apoptotic compound.

14. The composition according to claim 13, wherein said apoptotic compound is a chemotherapeutic compound.

15. The composition according to claim 1, wherein said compound of Formula (a) or (b) upon exposure to a susceptible cell increases the cell's intralysosomal cystine level above 0.5 nmol/mg cell protein.

16. The composition according to claim 1, wherein said cancer is selected from the group consisting of estrogen negative breast cancer, estrogen positive breast cancer, prostate cancer, ovarian cancer, bladder cancer, brain cancer, head and neck cancer, kidney cancer, lung cancers such as small cell lung cancer and non-small cell lung cancer, myeloma, neuroblastoma/glioblastoma, pancreatic cancer, pancreatic islet carcinoma, skin cancers, liver cancers, melanoma, colon cancer, cervical carcinoma, and leukemia, retinoblastoma, and other epithelial-derived cancers.

17. A method of treating or preventing the development of cancer in a mammalian subject comprising treating cancer cells of said subject with a composition of claim 1.

18. The method according to claim 17, wherein said treating comprises administering said composition *in vivo*.

19. The method according to claim 17, wherein said treating comprises administering said composition *ex vivo*.

20. The method according to claim 18, wherein said administering comprises a route of administration selected from the group consisting of oral, topical, systemic, enteral, parenteral, intravenous, intramuscular, sub-cutaneous, intracutaneous, intraperitoneal, intra-portal, intra-prostatic, intra-arterial, intra-dermal, intra-thecal, intra-lesional, intra-tumoral, intra-bladder, intra-vaginal, intra-ocular, intra-rectal,

intra-pulmonary, intra-spinal, transdermal, subdermal, regional perfusion at the site of a tumor, nasal inhalation, pulmonary inhalation, impression into skin and electrocorporation.

21. The method according to claim 17, further comprising treating said subject, or exposing said subject to, a second cytotoxic agent, at a time selected from the group consisting of before treatment with the composition of claim 1, after treatment with the composition of claim 1 and concurrently with treatment with the composition of claim 1.

22. The method according to claim 21, wherein said cytotoxic agent is selected from the group consisting of a chemotherapeutic agent, an apoptotogen and radiation.

23. The method according to claim 17, wherein said treating comprises administering said composition to said subject at a dosage of from 1.0 μg to 500 mg/kg patient body weight.

24. The method according to claim 23, wherein said cancer is selected from the group consisting of estrogen negative breast cancer, estrogen positive breast cancer, prostate cancer, ovarian cancer, bladder cancer, brain cancer, head and neck cancer, kidney cancer, lung cancers such as small cell lung cancer and non-small cell lung cancer, myeloma, neuroblastoma/glioblastoma, pancreatic cancer, pancreatic islet carcinoma, skin cancers, liver cancers, melanoma, colon cancer, cervical carcinoma, and leukemia, retinoblastoma, pancreatic islet carcinoma, and other epithelial-derived cancers.

25. The method according to claim 17, wherein said compound of formula (a) is cystine dimethyl ester.

26. The method according to claim 17, wherein said compound of formula (b) is an aspartyl-cystamine dimethyl ester.

27. A method of determining sensitivity of cancer cells to apoptosis comprising: contacting said cancer cells in culture with a pharmaceutically effective amount of a composition of claim 1 and measuring the rate of apoptosis in said culture.

28. A pharmaceutical kit for the treatment of cancer comprising at least one composition of claim 1 in a dosage unit.

29. The kit according to claim 28, further comprising at least one compound of formula (a) and at least one compound of formula (b).

30. The kit according to claim 28, wherein said compound of formula (a) is cystine dimethyl ester.

31. The kit according to claim 28, wherein said compound of formula (b) is an aspartyl-cystamine dimethyl ester.

32. The kit according to claim 28, further comprising an additional cytotoxic compound.